

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 62073668  
PUBLICATION DATE : 04-04-87

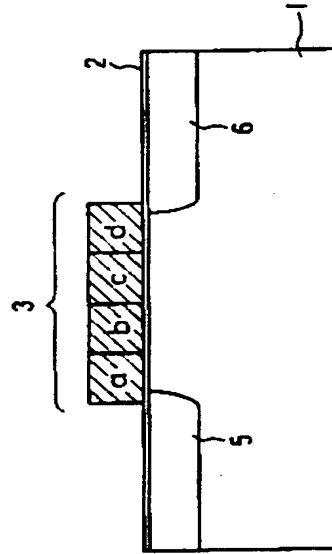
APPLICATION DATE : 27-09-85  
APPLICATION NUMBER : 60212180

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INT.CL. : H01L 29/78 H01L 29/62

TITLE : SEMICONDUCTOR DEVICE



**ABSTRACT :** PURPOSE: To control the characteristics of an element by imparting a gate electrode formed onto a semiconductor substrate through an insulating film a work function different in the channel length direction.

**CONSTITUTION:** A semiconductor device consists of an Si substrate 1, a gate oxide film 2, a gate electrode 3 and source and drain regions 5, 6, the gate electrode 3 is constituted of materials of a, b, c, d different in the channel length direction, and the work function of the gate electrode 3 is made different in the channel length direction. The work function in the channel length direction of the gate electrode is given distribution, thus allowing easy inversion only in sections in the vicinity of a source and a drain and difficult inversion only in a channel central section. In an N channel MOS transistor, the gate electrode having the work function, a value thereof is high in the gate electrodes (b), (c) at the central section of a channel and is low in the gate electrodes (a), (d) on both sides of the gate electrodes b, c, is used. In a P channel MOS transistor, the gate electrodes having the work function having distribution reverse to the N channel MOS transistor may be employed.

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